

Claims:

1. A method for operating an automotive engine comprising fuel injectors that open to deliver fuel to the engine, said method comprising:

providing a mechanical returnless fuel system for supplying fuel to the fuel injectors and including a fuel pump having a pump output;

providing a controller for regulating a opening time for the fuel injectors to deliver a precise quantity of fuel;

returning a portion of said pump output to the fuel supply;

determining a projected engine fuel demand;

determining an estimated fuel pressure of said mechanical returnless fuel system based upon the projected engine fuel demand; and

determining an opening time for said fuel injectors based upon the estimated fuel pressure.

2. The method of claim 1 wherein the mechanical returnless fuel system comprises a pressure regulating valve for returning said portion of said pump output to the fuel supply, and wherein the pressure regulating valve produces a fuel pressure that varies as a function of engine fuel demand.

3. The method of claim 1 wherein the step of determining an estimated fuel pressure comprises using a look-up table.

4. The method of claim 1 wherein the pump output is substantially constant.

5. The method of claim 1 wherein the automotive engine comprises a fuel rail for distributing fuel to said injectors, and wherein the estimated fuel pressure corresponds to the fuel pressure within the fuel rail.

6. In combination,
an automotive engine comprising fuel injectors that open for an opening time for delivering fuel to said engine;

a mechanical returnless fuel system for supplying fuel to said fuel injectors from a fuel supply, said mechanical returnless fuel system comprising a fuel pump having a pump output, a fuel line connecting the fuel pump to the fuel injectors and a pressure regulating valve for returning a portion of the pump output to the fuel supply;

a controller for regulating the fuel injectors, wherein the controller determines a projected engine fuel demand, determines an estimated fuel pressure based upon the projected engine fuel demand, and determines the opening time of the fuel injectors based upon the estimated fuel pressure.

7. In combination according to claim 6 wherein the pump output is substantially constant, and wherein the pressure regulating valve produces a fuel pressure in said fuel line that varies based upon actual engine fuel demand.

8. In combination according to claim 6 wherein the controller comprises a look-up table for determining estimated fuel pressure.

9. In combination according to claim 6 wherein the fuel line includes a fuel rail, and wherein the estimated fuel pressure corresponds to the fuel pressure of fuel within said fuel rail.